

REMARKS

Claims 11-18 are now pending and rejected in the application. No amendments are offered. Claims 11-18 remain pending.

REJECTION UNDER 35 U.S.C. § 103

Claims 11-18 are rejected under 35 U.S.C. § 103(a) as obvious over the Lutkus reference (U.S. Patent No. 6,224,311) in view of the Whitford Paper ("11 Reasons Why Chromium-free Xylan® 5230 is specified by DaimlerChrysler, Ford and General Motors"). Applicant respectfully traverses the rejection for the reasons given in their earlier replies. In addition, Applicant respectfully requests consideration of the following additional remarks.

Applicant agrees that a *prima facie* case of obviousness was made out against the earlier version of claim 11 on the basis of the Lutkus reference and the Whitford paper. In response, Applicant amended claim 11 to its present state, reciting that the claimed insert performed better in a prevailing torque test using tangless inserts than an insert coated with a chromium-containing fluoropolymer composition.

Applicant respectfully submits the added limitation is drawn to a structure and not just to recitation of an advantage. Performance in a torque test depends on the nature of the coating. If a torque test result is different for a claimed structure, the claimed structure must necessarily be different. Applicant has discovered a difference in structure as regards the claimed inserts, and has claimed that difference in a manner supported by his specification.

The Office Action cites *In re Obiaya* for the proposition that

"[recognition of] another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious" Section 5. Emphasis added.

As indicated by the emphasized parts of the quote from Obiaya, the rule is not absolute – the advantage must flow naturally, and the differences must otherwise be obvious.

There is no teaching in the cited references that the advantage (i.e., the difference in structure leading to improved torque tests) would naturally flow. The Whitford paper states that in certain fastener systems chromate free systems are preferred because they lack chromium; this is not a teaching that, as applied to inserts, the chromate free coatings would give an unexpectedly different structure. Any feature of chromium free coatings that would give rise to the structural difference recited in amended claim 11 was completely unknown and untaught by the references.

Because the claimed feature was unknown, it cannot be said the advantage would "naturally flow" from the references. Applicant respectfully submits that even if the effect is inherent, it was not known and can not be the basis of a rejection under § 103. See *In re Spormann* 150 USPQ 449, 452 (CCPA 1966) ("..., the inherency of an advantage and its obviousness are different questions. That which is inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.")¹. See also *In re Rijkaert* 28 USPQ2d 1955 (Fed. Cir. 1993), cited at MPEP §2141.03 V. ("obviousness cannot be predicated on what is not known at the time an invention is made, even if the inherency of a feature is later established").

¹ A copy of *In re Spormann* is attached for convenient reference

Applicant grants that there is a seeming tension between Obiaya and cases like Spormann. The former states (with some qualifications) that inherent properties do not make an invention patentable, while the latter seems to take the position that unknown features can be the basis of patentability, even if they are inherent. Applicant respectfully submits that in the current case the tension is resolved in his favor based on consideration of the patent statute and its "invention as a whole" requirement..

35 USC § 103 states that a novel invention is patentable unless

"the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art ... " Emphasis added.

The subject matter as a whole inquiry includes subject matter literally recited in the claim, and also to those properties which are inherent in the subject matter and are disclosed in the specification. *In re Antonie* 195 USPQ 6, 8 (CCPA 1977). See also MPEP §2141.03. That is, the current invention as a whole includes the recited feature that the coating (impliedly but necessarily) has an unexpected structure that leads to better performance of the coated insert in a torque test. Because the feature was completely unknown in the prior art, it cannot be said that the subject matter as a whole would have been obvious.

Applicant respectfully maintains his position that the combined references do not teach or suggest every element of the amended claims. Specifically, the independent claims 11 and 14 were amended earlier to recite that the inserts coated with a chromate-free polymer composition perform better in a torque test when compared with inserts coated with fluoropolymer compositions that do contain chromate. This feature

of the invention is fully disclosed, for example at paragraph 29 on page 8. Applicant respectfully submits that the cited references do not disclose or suggest this limitation of the amended claims. Accordingly, Applicant respectfully requests that the rejection as applied to the amended claims be withdrawn.

CONCLUSION

On the basis of the above, Applicants believe that claims 11-18 are in an allowable condition. Applicant respectfully requests consideration of these remarks after final rejection and issuance of an early Notice of Allowance. In the alternative, Applicant respectfully requests an Advisory Action stating whether the remarks can be considered at this time. The Examiner is invited to telephone the undersigned Applicant's representative if that would be helpful to resolving any issues.

Respectfully submitted,

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As is to be expected with an obviousness rejection, neither reference discloses a specific embodiment employing all the features of the claimed method. All of the embodiments specifically disclosed in Athy, described by the solictor in oral argument as the most pertinent references, utilize a transmitter along with two receivers and thus provide but one receiver-to-receiver measuring interval. The examiner and board rely on the suggestion in our first quotation from Athy that "it may in some cases be desirable to employ a greater number of receivers [receivers] than two" as teaching the use of three receivers. As to the requirement for the long and short receiver spacing, they rely on the excerpt from Athy quoted hereinabove which discusses the effect of different spacing of the transmitter-receiver and receiver-to-receiver intervals in the one transmitter and two receiver system specifically disclosed. On this latter point, reliance is also placed on Wyskoff's disclosure that spacing between the detectors and the source is varied depending upon the terrain, and the desired degree of resolving power, with "42 to 50 feet" separation being used in practice.

Some difficulty arises from the failure of the examiner and board to point out why they think the disclosure relied on would make it obvious to modify specific disclosures in the prior art of one transmitter-two receiver processes to provide appellants' process using three receivers which provide two receiver-to-receiver measuring intervals and are relatively spaced in a manner different from that of the specific prior art disclosures. Although the solictor undertakes to overcome some of that deficiency, we are not satisfied that the record demonstrates that the required modification, or selection of features, would have been obvious to a person of ordinary skill in the art.

In the first place, the more suggestions he makes, the more difficult it is to show that the formation is not obvious. In Athy that it may in some cases be desirable to employ more than two detectors does not disclose the possibility of any additional receivers. Not

3 The solictor apparently bases his statement that it is known that the receiver-to-receiver measurements are the "most" accurate on certain material in appellants' brief on which he considers as an acknowledgement of that proposition. However, that material, which states that systems using a pair of receivers in conjunction with a transmitter to provide a receiver-to-receiver measurement over come certain inaccuracies in systems utilizing a transmitter-receiver measurement, does not satisfy us that appellants have admitted the broad proposition the solictor urges.

ing that Athy suggests that the receivers "may be spaced on either side of the transmitter" and also that a single receiver may be used, a logical interpretation of the suggestion to use a greater number of receivers than two might be that either one or two receivers are disposed on opposite sides of the transmitter from the two provided in the systems specifically described. The disclosure certainly does not provide a clear teaching of using a third receiver in the position required by the claims nor does it teach the spacing required thereby.

The solictor, going into more detail than the examiner and board, urges that Athy's suggestion of using a greater number of receivers than four would lead to modification of the patentee's one transmitter-two receiver system by the addition of a third receiver for the purpose of making two simultaneous receiver-to-receiver measurements because "it is known that receiver-to-receiver measurements are the most accurate." However, no clear disclosure to the latter effect has been pointed out in the references.⁸

The quotation from Athy regarding spacing of the transmitter and receivers, set out hereinabove, suggests that the transmitters closer to the nearest receiver than the distance between the two receivers permits obtaining information regarding variations contributed by structure near the borehole, through the transmitter-to-borehole, through the transmitter-to-receiver measurements while the longer receiver-to-receiver measurements represent characteristics of undisturbed or virgin strata. That disclosure teaches merely that the shorter spacing is used to obtain information as to disturbed structures near the bore hole. It does not relate to detecting film earth processes or suggest modification of the record disclosures. Although the solictor undertakes to overcome some of that deficiency, we are not satisfied that the record demonstrates that the required modification, or selection of features, would have been obvious to a person of ordinary skill in the art.

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the thinnest rock formation to be located.

Wyskoff was cited primarily for its disclosure that the spacing between the detectors and source is varied depending upon the terrain and the ability to separate adjacent strata together with the reference to a separation of two to fifty feet. There is no suggestion there, however, that two intervals of different spacing be measured in connection with a single traverse of a bore hole, much less that both measurements be of receiver-to-receiver intervals.

[1] In summary, we think the examiner and board erred in finding the appealed claims obvious over the teachings of Athy and Wyskoff. The rejection is based on an improper piecemeal reconstruction of the prior art made in light of appellants' disclosure and not taught or made obvious by the reference disclosures. See In re Rothermel, 47 CCPA 806, 276 F.2d 383, 125 USPQ 328.

The decision of the board is reversed.

53 CCPA 1375

Court of Customs and Patent Appeals

Appl. No. 7699 Decided July 21, 1966

PATENTS

1. Evidence — Judicial notice (§ 3320) Pleading and practice in Patent Office—Rejections (§ 51.7) Although Board apparently took judicial notice of "spray drying" and, though court has heard of spray drying, it is not a technique of which court would feel free to take judicial notice if Patent Office wishes to rely on what "those familiar with spray drying would know," it must produce some references showing what such knowledge consists of.

2. Patentability — Invention — In general (§ 51.501) Inherency of an advantage and its obviousness are different questions that which may be inherent is not necessarily known; obviousness cannot be predicated on what is unknown. 3. Construction of specification and claims — By specification and drawings — In general (§ 22.251) Claims must be interpreted in light of specification.

Particular patent—Alkalai Sulfites Sulfurium and Hafnium Production of Solid Alkalai Sulfites, claims 7 and 8 of application allowed.

Appeal from Board of Appeals of the Patent Office. Application for Patent of Walter Sporman and Joachim Heinke, Serial No. 68,863, filed Sept. 16, 1956; Patent Office Group 110. From decision rejecting claims 7 and 8, applicants appeal. Reversed.

Before RICH, Acting Chief Judge, MARSH, SMITH, and ALMOND, Associate Judges, and KIRKPATRICK, Judge.* RICH, Acting Chief Judge.

This appeal is from the unanimous decision of the Patent Office Board of Appeals¹, petition for reconsideration denied, affirming the examiner's rejection of process claims 7 and 8 in application serial No. 68,863, filed September 16, 1956, for "Production of Solid Alkalai Sulfites." No claim has been allowed.

In essence, the invention is a process of producing alkalai metal sulfites from alkalai metal sulfides and/or ester-bonates by spraying the latter, in aqueous solution, into a dry gas containing sulfur dioxide, the temperature and humidity of the gas being such as to immediately vaporize the water to the end that very little sulfate is produced. The sulfate results from oxidation of the sulfide, but this apparently does not occur to any great extent if the sulfide is dry immediately upon its production. Sulfate is particularly likely to form when the treating gas contains a large amount of oxygen, as do waste gases which it is desired to use for economic reasons.

Claim 7 reads (breakdown ours):

7. A process for the production of United States Sealer, Judge for the Eastern District of Pennsylvania, design to participate in place of Chief Judge Worthy, pursuant to provisions of Section 251(d), Title 25, United States Code.

1. Consisting of Examiner-in-Chief

Brennan and Wyman, the latter writing

solid alkali metal sulfite which comprises: passing a finely dispersed aqueous solution of an alkali metal compound selected from the group consisting of sodium hydroxide, potassium hydroxide, potassium carbonate, potassium bicarbonate, potassium hydrosulfide, potassium carboxylate, potassium bicarbonate and mixtures thereof, into a substantially dry gas containing sulfur dioxide, maintaining the temperature of said dry gas at a level such that the water introduced with the solution and formed by the reaction of the alkali metal and the sulfur dioxide is immediately vaporized, and thereafter separating from the solution of alkali metal sulfite which is formed by the reaction of the sulfur dioxide and the alkali metal compound.

Claim 8 differs from claim 7 in two respects. (1) The finely dispersed solution of alkali metal compound is passed "into an upwardly directed stream" of the dry gas containing sulfur dioxide and (2) the temperature of the dry gas is maintained "between about 20 and about 150°C."

According to appellants' brief (emphasis ours):

It has long been known, of course, that sulfur dioxide (SO_2) can be reacted with alkali metal hydroxides or carbonates to produce sodium sulfite. Ordinarily a solution of sodium hydroxide or the like is reacted with SO_2 gas. There is one major drawback to the use of the known processes. The formed sulfite tends to oxidize, especially in the presence of heavy metal ions. Sodium sulfite, for example, oxidizes to form sodium sulfate (Na_2SO_4). To prevent oxidation of the sulfite it was considered necessary to exclude atmospheric oxygen by using a controlled sulfur dioxide gas containing relatively minor amounts of free oxygen or by carrying out the reaction between the sulfur dioxide and the alkali metal hydroxide in an inert atmosphere. The need for controlled SO_2 gases made it impossible to use "roster or waste gases" containing sulfur dioxide which are formed in great quantities during the production of sulfuric acid. That protective measure described above is

precisely known. What is known is that the water must be vaporized in the reaction zone leaving only vapor and solid alkali metal sulfite. Much of this discussion also appears in appellants' specification.

The examiner finally rejected the claims as unpatentable "over any of the following patents:

Haywood 2,210,405 Aug. 6, 1940
Aydelotte et al. 1,982,211 Nov. 27, 1934
Friedrich et al. 1,081,429 Mar. 24, 1914
Stricker 1,023,119 Apr. 16, 1912
In his answer, the examiner also said

difficult to carry out especially in a commercial process. It has also been suggested that the oxidation of alkali sulfite be suppressed by adding substances to the solutions which are capable of binding heavy metal ions. In such processes, however, the metal ions become impurities which contaminate the alkali sulfite.

A method was found by appellants whereby alkali sulfite can be obtained from alkali hydroxides or alkali carbonate and sulfur dioxide without the concurrent formation of substantial amounts of alkali sulfate. The process is carried out successfully without the addition of materials which contaminate the sulfite. In the process, a finely dispersed aqueous solution of an alkali metal hydroxide or carbonate or bicarbonate is passed (sprayed) into a substantially dry gas containing sulfur dioxide. The temperature and relative humidity of the gas are maintained at such levels that the water introduced into the reaction zone and formed by the reaction of the alkali metal and the sulfur dioxide is immediately vaporized. Thereafter, solid alkali metal sulfite is separated from the gas. The sulfite is formed instantaneously in the dry form and is longer exposed to the action of oxygen which is present in the gas. In the subject process, unlike the prior art processes, it is possible to use waste gases as a source of SO_2 , which gases contain large quantities of oxygen (as much as 60 parts of oxygen per part of SO_2).

In the process, therefore, a finely divided liquid and a gas are passed into the reaction zone and solid sodium sulfite particles and water vapor leave the reaction zone. The exact point where the transition from liquid to solid and vapor occurs is not precisely known. What is known is that the water must be vaporized in the reaction zone leaving only vapor and solid alkali metal sulfite.

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"Appellants' process is considered nothing more than the application of the teaching of Friedrich et al. to a spray process such as is described in Aydelotte et al. Such a combination does not meet the proviso for patentability set forth in 35 U.S.C. 102."

The Board said: "As recognized by the examiner, the rejection on Stricker appears to be cumulative, but we will sustain the rejection as being one on Friedrich et al. in view of Aydelotte et al. or Heywood."

Friedrich et al. disclose a process for making sodium sulfite wherein a raw material such as sodium hydroxide or sodium carbonate is passed in a solid, powdered form through a horizontal rotating drum having radial plates or helical screw threads which cause the solid raw material to be turned and transported through the vessel. Sulfur dioxide gas is passed in countercurrent flow through the material within the drum. The solid, crushed raw material contains "a definite quantity of chemically combined or hygroscopic water" throughout the entire process, the amount of which is so calculated in each individual case, that the heat of the reaction occurring on the absorption of the sulfuric acid gas [SO_3] will partially or completely evaporate the water, so that the finished product issuing from the apparatus will exhibit the required degree of moisture or dryness." The amount of moisture is apparently selected so that the final product will be free flowing yet dustless. The invention is described as an improvement over, and is contrasted with, the then known (1910) "wet" process by eliminating the equipment, power, and related expenses necessary for separation of product from solution.

Aydelotte et al. disclose a process for reducing the sodium hydroxide (caustic soda) content of solutions containing a mixture of sodium hydroxide and potassium hydroxide (caustic potash). The patentees objective is to produce caustic soda-caustic potash solution mixtures of certain ratios which they use in making synthetic indigo, the sodium sulfite being a mere by-product. The mixture, in solution, is treated with waste gas containing sulfur dioxide, either by bubbling the gas through the liquid, countercurrent spraying of the liquid into the gas, or other means until a test portion which is evaporated to about 50% "B.D." cooled to about 46°C. and filtered shows that the ratio of milked caustic has been changed to 40% of caustic soda and 50% of caustic potash." The whole batch of solu-

This temperature under ordinary conditions will scarcely rise to about 70°C. If desired, the combustion gases [from a sulfur burner where SO_2 is generated for the process] " * * * may be cooled to a certain extent by water introduced into the tower * * *. This, however, is not necessary and may be dispensed with, if desired. There is no objection to introducing the gases into the absorber at a temperature of about 40° and 55° C. [emphasis ours.]

Stricker discloses a process for producing sodium sulfites, an object of which is to prevent the formation of sulfates through oxidation, which is appellants' principal object. However, in the Stricker process, SO_2 gas is passed into a suspension of sodium carbonate in a saturated solution of sodium sulfate. A temperature of about 49°C. comparing appellants' process with the prior art, clearly the basic chemical reaction embodied in their process is old, as their specification acknowl-

edges Aydelotte et al. would also suggest to one skilled in the art bringing

about this reaction by countercurrent spraying of a liquid containing sulfuric acid into a gas containing sulfur dioxide. The issue therefore is: would it be obvious to one of ordinary skill in this art to conduct the old reaction by such spraying under off the conditions set out in the claims and obtain appellants' results, i.e., would the invention as a whole have been obvious? The board said:

Taking cognizance of the fact that spray drying is an old expedient for obtaining a solute in dry form, we fail to see that it is obvious to modify the method taught by Friedrich et al. so that a solution of sodium carbonate, for instance, is passed in zinc droplet form through the gaseous current comprising sulfur dioxide instead of the finely powdered carbonate of Friedrich et al., particularly as Aydelotte et al. and Haywood do show, at least, that it is old to spray an alkaline hydroxide or carbonate solution through sulfur dioxide gas to obtain the corresponding sulfite.

Both appellants and Friedrich at al. obtain a dry sulfite and in such a simultaneous drying and chemical reaction process it is thought to be a mere difference to deprive whatever water is present, if such an amount as to dissolve the carbonates or merely present as admixture, of the result of spray-drying process. The result of spray-drying process is said to be a product low in ash content, notwithstanding the use of waste gas containing relatively large amounts of oxygen, an asserted advantage of which is not necessarily known. Obviously cannot be premised on what is unknown.

Stricker appears to be the only reference which deals with the problem of preventing the formation of sulfite during sulfite production but appears to solve the problem only by avoiding its cause. Sulfur dioxide gas is passed through a solution rather than waste gas containing oxygen and sulfur dioxide. Appellants, however, states without refutation by the Patent Office, that this [Stricker] process would only be successful where atmospheric oxygen is excluded and where heavy metal ions are not present. The Patent Office treats this reference as "cumulative" and places little reliance on it.

[2] The board's reference to "spray drying" appears to have been infected as, eponymous of which it was taking judicial notice, without having been mentioned in any reference of record.

While Aydelotte et al. and Haywood both disclose spraying of some sort, neither spray dries. While we have heard of spray drying, it is not a technique of which we would feel free to take judicial notice. We are of the

opinion that the Patent Office wishes to rely on what "those familiar with spray drying would know." It must produce some references showing what such obviousness conjures up. So far as we can see, appellants do spray and produce a spray solution. We are unable to find, however, any indication in the references that such a spray would have the effect which appellants sought and found, namely, a reduction of the undesirable oxidation of sulfite to sulfate in an old reaction leading to produce sulfate when the reactant gas contained large amounts of oxygen.

[2] The board apparently thought that the minimizing of sulfate production would be inherent in the process of Friedrich et al. However, this is no support for a rejection for various reasons. Friedrich et al. make no mention of it, as the board conceded. Their process is "not appellants' process. It is a reaction between solid, powdered material and gas, the only water present being chemically combined water in hydroscopic water," appellants' spray-dried solution and 208. As we pointed out in re Evans, 66 COPA 956, 66 USPQ 998, 148 USPQ 722, the inherent of an advantage and its obviousness are entirely different questions. The which may be inherent is not necessarily known. Obviously cannot be premised on what is unknown.

The result of spray-drying process is said to be a product low in ash content, notwithstanding the use of waste gas containing relatively large amounts of oxygen, an asserted advantage of which is not necessarily known. Obviously cannot be premised on what is unknown.

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real on this reference, distinguishing only—but admittedly—in their references to the use of a "solution" and naming the alkali metal reactants, Haywood is interested in producing calcium sulfite as a paper filler. It is an alkali metal compound and therefore outside the claims. It is produced from a suspension, not a solution, of lime (Ca(OH)_2) or limestone (calcium carbonate, CaCO_3) brought into contact with a gas containing SO₂. No effort at all is made to dry the product or the gas. In fact, the conditions are such that as fast as the sulfite is formed it falls back into the suspension whence came the raw material. The gas treatment takes place in an "absorber," which is a vessel with liquid in the bottom having an agitator which revolves the liquid and splashes it upwardly from its surface where it is contacted by the gas. Since the gas is exhausted through a stack the Patent Office would have to treat this as an "upwardly directed stream," within claim 8. We will not do so as this would distort the meaning of the claim when read in the light of the specification. Besides, gas flow in the absorber is horizontal. Next, reliance is placed on Haywood's temperature disclosure. Here an obvious attempt is made to drag from conditions of temperature and relative humidity as to cause all water present to be immediately vaporized. This is the claimed invention and in our opinion its basic underlying concept is not to be found in the prior art of record.

The rejection of claims 7 and 8 is reversed.

Our view is that one faced with the problem of how to use oxygen-containing waste gases in the production of alkali metal sulfites without undue production of sulfite would receive no suggestion from the references to spray a solution of the alkali metal compound into the gas stream under such conditions of temperature and relative humidity as to cause all water present to be immediately vaporized. This is the claimed invention and in our opinion its basic underlying concept is not to be found in the prior art of record.

The rejection of claims 7 and 8 is reversed.

Court of Claims of the United States
MINE SAFETY APPLIANCES COMPANY
et al. v. UNITED STATES
No. 307-60 Decided July 15, 1966
PATENTS

1. Title—Licenses — In general (§ 65-401)
One having license under patent has complete defense to charge of infringement when patent or invention is used in accordance with license.
2. Title—Licenses — Construction (§ 65-407)
[3] Finally, the solicitor argues on the basis of Haywood's optional and after debilitation of his sulfite suspension as to show how the claims can almost be